are structurally similar to PAHs but little information is available on their toxic properties. Some indications suggest similar or higher toxic potential than PAHs. The main objective of the present work was to evaluate the toxicological properties of a number of PANHs selected according to number of rings (3 up to 5) in comparison to their respective PAH structural analogues.

We have applied an *in vitro* test battery covering activities considered of toxicological relevance for this group of chemicals:

- nuclear receptors activity/inhibition (e.g. Aryl Hydrocarbon receptor (AhR) activation),
- genotoxicity potential (e.g. Gadd45α, Histone phosphorylation),
- cell viability in presence or absence of metabolic activation (±S9).

Results with the well-characterized PAH reference, Benzo(a)-pyrene were in agreement with literature data, confirming the suitability of the tests selected. There was no trend between cytotoxicity potency and either ring number or PANHs vs PAHs. The most potent genotoxic chemicals were found amongst the high number of ring chemicals, and in presence of S9. AhR activation was the most sensitive parameter with a direct correlation between potency and the ring number. There were no striking differences between PANHs and PAHs for these parameters.

Compared to respective PAH analogues, the tested PANHs exhibit similar toxicological profiles and are likely to raise similar toxicological concern. However, PANHs may not bring significant additional risk burden since exposure seems much lower than for PAHs.

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In vitro dermal absorption of propylidene phthalide, a cosmetic ingredient

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Propylidene phthalide, regulatory usage limit of 0.01%, is a volatile liquid that is used in the cosmetics as a fragrance. To determine dermal absorption, this study was performed according to Korea Ministry of Food Drug Safety (MFDS) guideline using LC–MS/MS. The analytical method of propylidene phthalide was acceptable through method validation of linearity ($r^2 = 0.9994$, $y = 0.000359 * X + 0.00434$), precision and accuracy. In this study, applied formulation on the excided rat skin about 113 mg/cm^2 was cream containing 0.7% of propylidene phthalide. The stability of propylidene phthalide in receptor fluid (50% Ethanol, EtOH) at 32 °C was sufficient for use up to 24 h. The times of collected receptor fluids were set at 0, 1, 2, 4, 8, 12 and 24 hr from receptor chamber. After 24 h, remaining formulations on the skin and stratum corneum (S.C) were collected by swabbing alcohol cotton and tape stripping, respectively. Collected samples (alcohol cotton, tape and skin) were extracted by acetonitrile (ACN) for 24 h. Total dermal absorption rates of propylidene phthalide was calculated to 12.4 ± 2.8%. This data can be used for further exposure assessment of propylidene phthalide.

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In vitro 3D cell sheet-based model for unraveling scar pathophysiology

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Fibroblasts are key players in the scarring process. In hypertrophic scars, fibroblasts suffer phenotypical changes into myofibroblasts persisting in the wound under the influence of local biochemical (TGFb1) and biomechanical signaling leading to enhanced immature extracellular matrix (ECM) synthesis.

Benchtop models of hypertrophic scars rely on scarce human ex vivo samples or standard 2D cultures of hypertrophic scar fibroblasts. We therefore propose the use of human dermal fibroblast cell sheets (hDFbsCS) as the first step to attain cell sheets with a myofibroblast-like phenotype to generate cohesive *in vitro* 3D scar-like tissues.

hDFbsCS were produced as previously described (Cerqueira, 2014), and stimulated with TGFb1 up to 21 days. Following phenotype and ECM characterization, 3 hDFbsCS were stacked to obtain a 3D structure. Gene and protein analysis showed that upon TGFb1 stimulation, hDFbsCS present a higher expression of aSMA, fibronectin EDA and EDB, characteristic of a myofibroblast-like phenotype. Regarding the expression of scar ECM-associated proteins, TGFb1 stimulated hDFbsCS produced increased fibronectin and collagen I. Upon stacking of hDFbsCS obtained after 7 days of culture in the presence of TGFb1, stable and integrated 3D constructs were obtained.

This work suggests that it is possible to create cohesive 3D scar-like tissue structures from hDFbsCS opening the possibility to develop *in vitro* 3D scar models to study wound healing deregulation pathophysiology.

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Online TEER measurements for barrier model systems in microfluidic chips

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Human-on-chip technologies are developing rapidly last five years. Only few of available systems capable for cultivation of different cell types in closed environment, representing human organs. Different end-point analysis techniques are used to test cell function after

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